

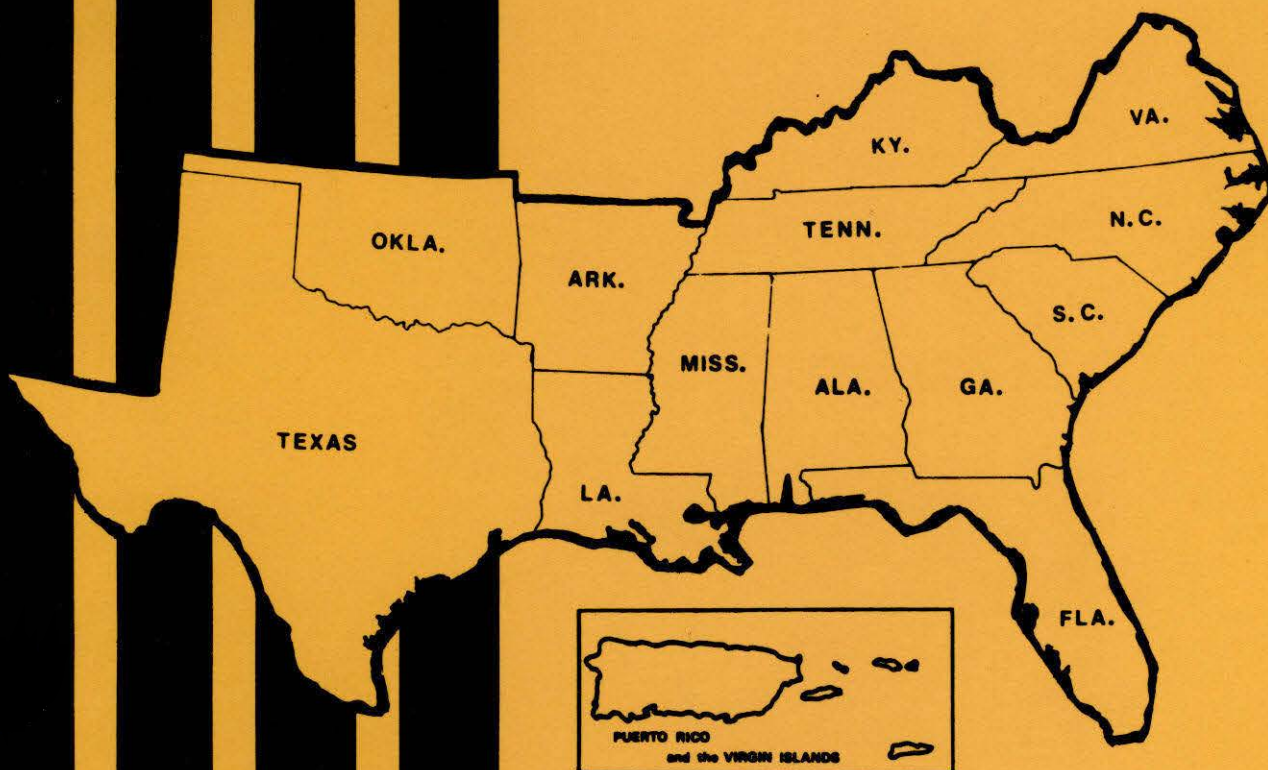
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## SOUTHEASTERN AREA

# State & Private Forestry



THE STATUS OF OAK WILT IN TWO EASTERN  
TENNESSEE COUNTIES - 1974



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THE STATUS OF OAK WILT IN TWO EASTERN  
TENNESSEE COUNTIES - 1974

By

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ABSTRACT

Results obtained from an oak wilt survey in Greene and Washington Counties, Tennessee in late June, 1974 revealed a continued low endemic disease incidence. Five infected trees were detected from 20 percent aerial and ground survey coverage and confirmed by culturing of the conidial stage of the fungus, *Ceratocystis fagacearum*. Four trees were in Greene County and one was in Washington County. The present survey covered 396,100 acres in Greene County and 209,300 acres in Washington County. The next trend survey is scheduled for 1979.

INTRODUCTION

Since its initial discovery in Wisconsin in 1942 (Henry, 1944), oak wilt, caused by the fungus *Ceratocystis fagacearum* (Bretz) Hunt, has been detected in 21 central and eastern United States. Over 50 species of oaks are known hosts of this fungus that is apparently native to the United States.

Oak wilt was detected in eastern Tennessee in 1951. Previous studies indicate that the initial fungus infection probably occurred in Greene County in about 1945 or 1946 (Hepting, 1955). Presently, the disease has been detected in 22 Tennessee counties, primarily in the eastern

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half of the state (Fig. 1). Results obtained from several oak wilt surveys in Tennessee during the past 10 years have revealed a continued low endemic disease incidence (Astin and Quillen, 1965; Dean, et.al., 1967; Cordell, et.al., 1969).

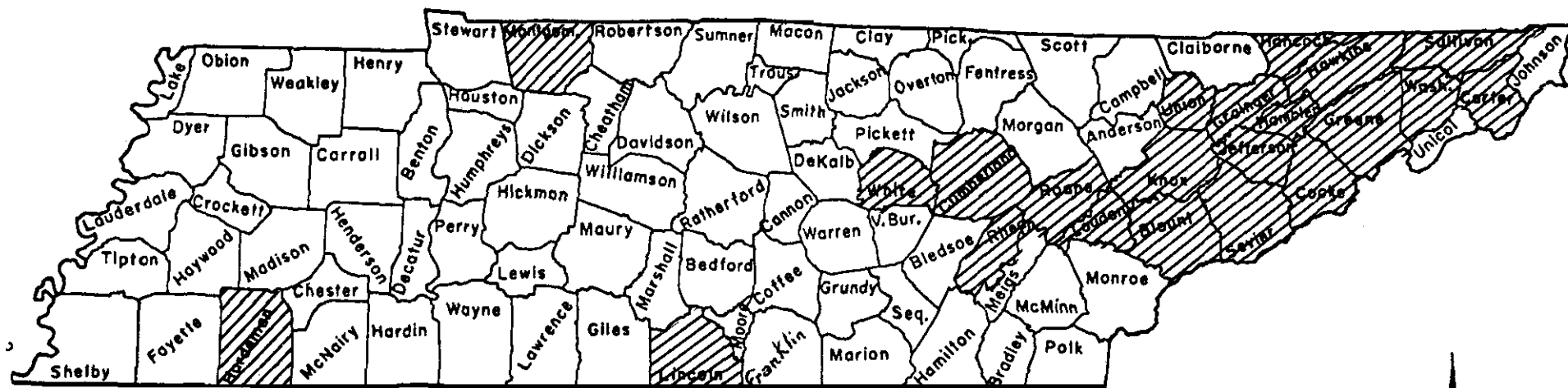
Intensive studies concerning the rate and methods of oak wilt spread were conducted in Greene and Washington Counties, Tennessee, by the Southeastern Forest Experiment Station between 1951 and 1961 (Stegall, 1962). This project, which was designed primarily to test the effectiveness of possible disease control measures, was transferred to the Division of Forest Pest Control in 1962. Field study results obtained in these two counties between 1951 and 1963 are shown in Table I and reflect a continued low endemic oak wilt incidence during this time period (Cordell, et.al., 1963).

The primary objective of the 1974 survey was to compare survey results obtained with those of previous surveys in a continuing effort to establish and follow the disease trend in affected southeastern United States localities. Greene and Washington Counties were selected as disease trend survey study areas in eastern Tennessee as a result of their representing the earliest known and most intensively surveyed oak wilt affected areas in the Southeast.

## METHODS

A 20 percent aerial survey was conducted in the two counties on June 25, 1974. The flying was accomplished using a Cessna 210 aircraft at altitudes between 500 and 1,000 ft. above the prevailing terrain and at an average air speed of 90 to 100 miles per hour. The flight crew consisted of the pilot, tracker (navigator), and two observers. Flight lines were flown 5 miles apart in a north-south direction across the long axis of each county. Therefore, each observer examined a one-half mile wide survey strip on each side of the airplane. All aerial oak wilt suspects were plotted on TVA 15 minute topographic quadrangle maps (scale approximately 2.5 in. per mile). The total area surveyed encompassed 619 sq. miles (396,100 acres) in Greene County and 327 sq. miles (209,300 acres) in Washington County.

All oak wilt aerial suspects were ground checked June 25-27, by the Tennessee Division of Forestry Insect and Disease Specialist and Area Forester with technical assistance provided by Forest Pest Management, SEA-S&PF plant pathologist. Several 6- to 8-inch long branch samples were obtained from at least one oak wilt symptomatic tree per infection center. Tissue cultures were made from all samples and cultured in the



Counties with minimum of one oak wilt infection.

Scale - statute miles

0 25 50

FIG. 1. DISTRIBUTION OF OAK WILT IN TENNESSEE - 19<sup>74</sup><sub>68</sub>

Table 1. Summary of oak wilt surveys in Greene and Washington Counties, Tennessee, 1951-1963

GREENE COUNTY								
Year	Old known centers examined		Newly found infection centers		Total active Centers	Degree of Coverage	Method of Survey	Centers treated
	Total	Active	Previous infection	Initial infection				
	Number	Percent	Number	Number	Number	Percent		Percent
1951	-	-	3	1	4	10	Roadside	-
1952	4	25	1	0	2	10	Roadside	-
1953	5	20	2	3	6	60	Aerial	-
1954	10	60	7	7	20	100	Aerial	-
1955	48	25	11	8	31	75	Aerial-roadside	100
1956	51	24	23	2	37	100	Aerial-roadside	65
1957	61	23	29	6	49	100	Aerial-roadside	95
1958	118	26	24	27	82	100	Aerial-roadside	98
1959	169	18	12	22	64	100	Aerial-roadside	99
1960	171	17	7	21	58	100	Aerial-roadside	91
1961	237	16	11	25	73	100	Aerial-roadside	92
1962	223	12	2	26	55	100	Aerial-roadside	0
1963	172	17	2	23	55	100	Aerial-roadside	-
WASHINGTON COUNTY								
1951	-	-	1	0	1	10	Roadside	-
1952	1	-	2	0	2	10	Roadside	-
1953	3	-	5	6	11	60	Aerial	-
1954	14	21	11	3	17	100	Aerial-roadside	-
1955	25	32	11	1	20	-	Limited roadside	-
1956	38	13	5	0	10	-	Limited roadside	-
1957	-	-	-	-	-	0	None	0
1958	45	16	34	41	82	100	Aerial-roadside	0
1959	120	17	21	11	51	100	Aerial-roadside	0
1960	137	27	17	24	78	100	Aerial-roadside	0
1961	197	18	11	23	70	100	Aerial-roadside	0
1962	175	15	6	19	52	100	Aerial-roadside	0
1963	169	23	2	16	57	100	Aerial-roadside	0

Total area surveyed is 619 square miles in Greene County and 327 square miles in Washington County.

laboratory utilizing standard oak wilt isolation and identification techniques (Barnett, 1953; True, et.al., 1960). In addition, all sample material was maintained under refrigeration until cultured in the laboratory.

## RESULTS

Of a total of 21 spots aerially detected in Greene and Washington Counties, samples from 10 oaks in eight infection centers were cultured. Three trees of the red oak group and one post oak were positive for the oak wilt fungus in four spots in Greene County. Three of the oaks represented new infection centers and one center was previously infected. The conidial stage of *C. fagacearum* was isolated from one black oak in Washington County which was a new infection center.

## DISCUSSION

Comparisons of results obtained from this survey with those of the last oak wilt survey conducted in 1969 indicates that the incidence of *C. fagacearum*-infected oaks in these two counties has remained at approximately the same level. Similar oak wilt surveys conducted in Arkansas in 1973 revealed similar results with an absence of either disease intensity or spread (Tainter, et.al., 1974). Therefore, the endemic nature of oak wilt in the southeast is reflected in these two eastern Tennessee counties where the oak type predominates (Hedlund and Earles, 1971). However, it is also interesting to note that the oak wilt fungus is still active and causing mortality in this eastern Tennessee region where its presence has been known for approximately 25 years.

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